



**MISSOURI DEPARTMENT OF TRANSPORTATION
MATERIALS ENGINEERING
JEFFERSON CITY, MISSOURI**

**Test Method
MoDOT T32
DETERMINATION OF PURITY OF SODIUM CHLORIDE**

1.0 Scope. This method describes a procedure for determining the percent sodium chloride in commercial grades of sodium chloride.

2.0 Reagents and Apparatus.

2.1 Millivolt meter equipped with a combination chloride electrode.

2.2 Nitric Acid (HNO_3), chloride free, 1.42 specific gravity.

2.3 Sodium Chloride (NaCl), Reagent Grade, dried at 105-110C for 1 hour prior to use.

2.4 Silver Nitrate (AgNO_3), Reagent Grade.

2.5 A source of chloride-free distilled or deionized water.

3.0 Preparation of Standard Solutions.

3.1 Standard Sodium Chloride Solution (0.0100N). Weigh 0.5844 g dried NaCl , dissolve in distilled water and dilute to 1L.

3.2 Standard Silver Nitrate Solution (0.01N). Weigh 1.699 g AgNO_3 , dissolve in distilled water and dilute to 1L. Standardize to the nearest 0.0001 N against 0.0100 N NaCl .

4.0 Procedure.

4.1 Using a suitable sample splitting technique, divide the salt, as received, to obtain a representative sample of about 75 g. Finely grind the sample and dry at least 3 hours at 105-110C and cool to room temperature in a dessicator. Weigh the sample to the nearest 0.1 mg and transfer to a 1000-mL beaker. Add approximately 500 mL of distilled water and 20 mL of HNO_3 . Heat near boiling 1 hour, stirring occasionally. Cool to room temperature, quantitatively transfer to a 1000-mL volumetric flask and dilute to volume with distilled water. Transfer a 10-mL aliquot to a 1000-mL volumetric flask and dilute to volume with distilled water.



4.2 Transfer a 10-mL aliquot to a 250-mL beaker, adding 90 mL of distilled water and 1 mL of HNO₃. Determine the chloride concentration by potentiometric titration with the standard silver nitrate solution.

5.0 Calculation and Report.

5.1 Report percent sodium chloride to the nearest 0.1% as follows:

$$\% \text{ Sodium Chloride (NaCl)} = \frac{A \times C \times 584.5}{D} \times 100$$

Where:

A = Milliliters of AgNO₃ solution to titrate sample

C = Normality of AgNO₃ solution

D = Grams of sample